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# Vaginal probiotic may help in pregnancy

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Microbiology researcher Nicole Jimenez is studying how bacteria in the vaginal canal can positively influence the growth of a healthy infant

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Consuming probiotics is a healthy fad that nutritionists and doctors are encouraging; eat enough, and your digestion will improve. However, millions of “good” bacteria live in us and perform healthy functions. Women, for example, have probiotics that originate in the vaginal canal. One particular kind of bacteria there may provide benefits during pregnancy.

Dr. Nicole Jimenez, a microbiology researcher at VCU, is experimenting with a microorganism called bifidobacteria in hopes that it might help



Microbiology researcher Nicole Jimenez

**‘B. breve is theorized to provide a protective role in the vaginal community as it has played a beneficial role in the gut microbiome.’**

us understand the development of the infant gut microbiome.

“I’m researching the role this species plays in the vaginal microbiome and how it may provide insight into infant gut development,” Jimenez said.

Studies have been performed on *bifidobacterium breve*, a species in the *Bifidobacteriaceae* family, but not many in the vaginal canal.

*Bifidobacterium breve* is found in gut, oral, human milk and vaginal microbiomes. Previous studies have examined the transmission of commensal bacteria. They show how microbial succession occurs within the gut microbiome of an infant via interaction with the mother’s microbiomes.

“*B. breve* is theorized to provide a protective role in the vaginal community as it has played a beneficial role in the gut microbiome,” Jimenez said.

Jimenez says researchers from the Vaginal Microbiome Consortium at the Medical College of Virginia collected samples from a group of women 18 and older. She helped select 12 vaginal samples with assistance from the VCU Nucleic Acid Research Facility to find their genomic sequence. Jimenez is comparing these strains to *B. breve* genomic sequences from other areas: in human milk, the gut, the mouth and vaginal sites.

“For Aim #1, we focused on the Pan-genome Analysis of Human Niche Specific *Bifidobacterium breve* strains,” Jimenez said. “We selected samples from women with no current gynecological diagnosis with a *B. breve* vagitype.”



Dr. Jimenez is researching the role that bifidobacteria plays in the vaginal microbiome.





Her research may provide insight into infant gut development. (Photo courtesy of Dr. Jimenez)

Jimenez found that the genomic sequences of vaginal *B. breve* are similar to the genomic sequences of vaginal *B. breve* from other body sites. However, she says there is plenty more work to accomplish.

“For Aim #2, we wanted to understand the stability of *B. breve* in the vaginal microbiome over time – in this case, approximately one year,” Jimenez said.

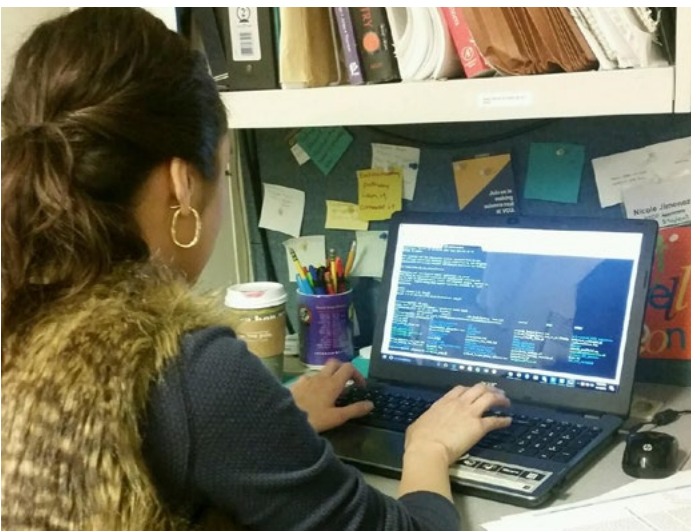
“We selected paired vaginal samples from three women who completed two annual clinical exam visits approximately one year apart and who exhibited at least 25 percent abundance of *B. breve* in their vaginal microbiome at both visits. Half of these samples exhibited the *B. breve* vagitype of greater than 35 percent abundance, so three were [also] included in Aim #1.”

Jimenez says VCU’s Nucleic Acid Research Facility performed basic bacterial culturing techniques and genomic preparation for DNA sequencing.

Once Jimenez received the genomic sequence, she could begin identifying “genomic differences and metabolic differences between sequences either from different niche-strain isolates or different isolates from different time points.”

More extensive research will be done because she is still analyzing the data.

“My work is pertinent to the field because it adds more vaginal sequences for future comparative genomic work, since currently there is lack of vaginal *Bifidobacterium* sequences,” Jimenez said. •



Dr. Jimenez says more extensive research will be done because she is still analyzing the data. (Photo courtesy of Dr. Jimenez)